Red Pine

Pinus resinosa

The **volume of red pine has increased** significantly since 1983. This volume increase has occurred almost exclusively on sawtimber-sized trees. The number of seedlings has also increased in the last 10 years, suggesting that red pine will continue to play a significant role in the future.

Growth rates of red pine have increased and the ratio of growth to volume in 2012 was much higher than the statewide average. The **ratio of mortality to volume for red pine is much lower** than the average for all species. Red pine makes up about 7.6% of all volume of trees in Wisconsin, but 12.5% of growth and 1.3% of total mortality.

Red pine is **an important timber species**, accounting for over 11% of roundwood production in 2009. Red pine roundwood is mainly used for pulpwood and sawlogs, ranking second in sawlog production.

- *How has the red pine resource changed?*
  Growing stock volume and diameter class distribution: 1983, 1996, and 2012
- *Where does red pine grow in Wisconsin?*
  Growing stock volume by region with map
- *How fast is red pine growing?*
  Average annual net growth by region and year: 1983, 1996, and 2012
- *How healthy is red pine in Wisconsin?*
  Average annual mortality: 1983, 1996, and 2012
- *How much red pine do we harvest?*
  Roundwood production by product: 1997, 2003, and 2009
- *How much is red pine selling for?*
  Prices for cordwood and sawtimber: 2000 to present
- *How much red pine biomass do we have?*
  Aboveground carbon by region of the state: 2012

"How has the red pine resource changed?"

Growing stock volume and diameter class distribution by year

The growing stock volume of red pine has doubled since 1983 to 1.6 billion cft or 7.6% of statewide volume (Chart 1). The volume in red pine has more than doubled since 1983 and has increased 61% since 1996.

Red pine is mainly a planted species. This increased volume has occurred mainly in sawtimber trees (Chart 2 & 3). Since 1996, the volume in sawtimber trees has doubled.

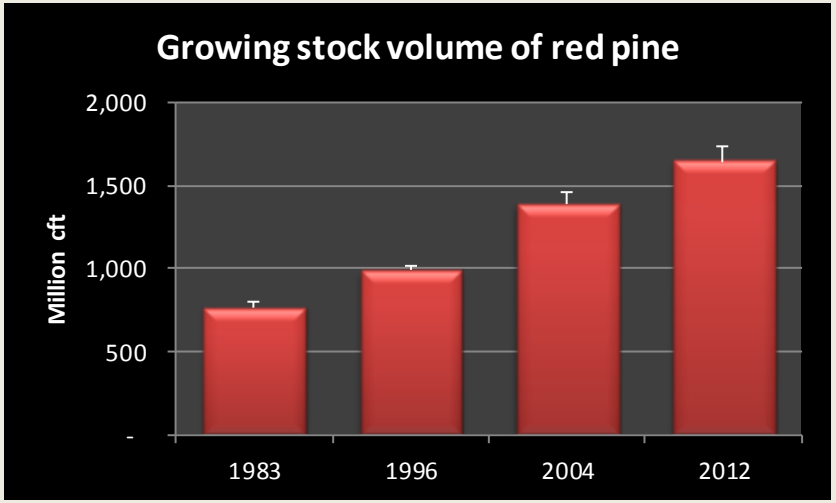


Chart 1. Growing stock volume (million cubic feet) by inventory year.
Source: USDA Forest Inventory and Analysis data: 1983, 1996, and 2012.

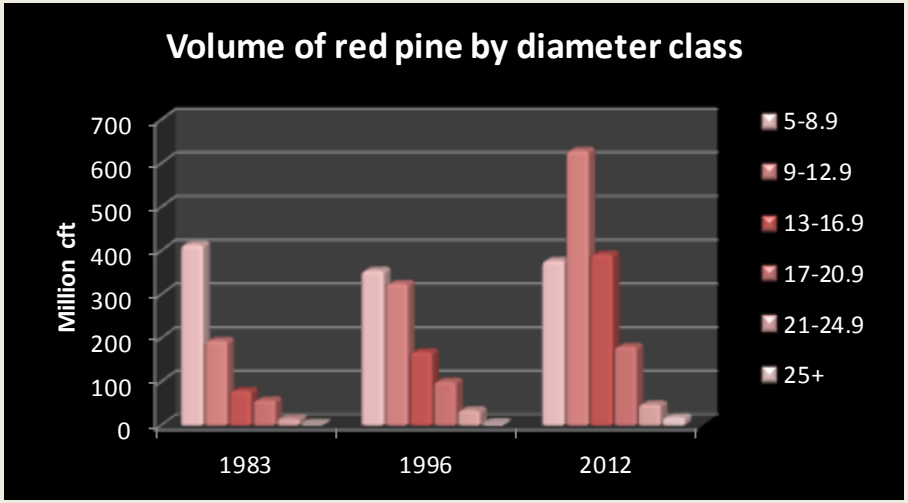


Chart 2. Growing stock volume (million cubic feet) in 1983, 1996, and 2012.
Source: USDA Forest Inventory and Analysis data: 1983, 1996, and 2012.

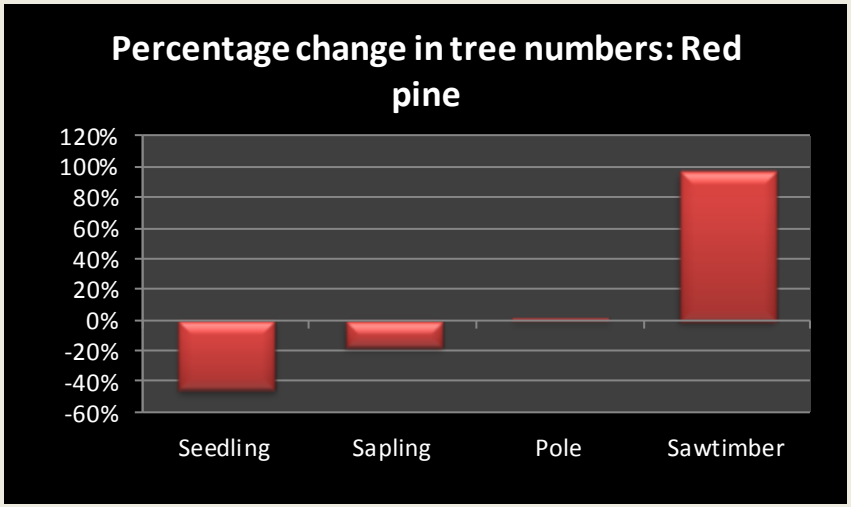
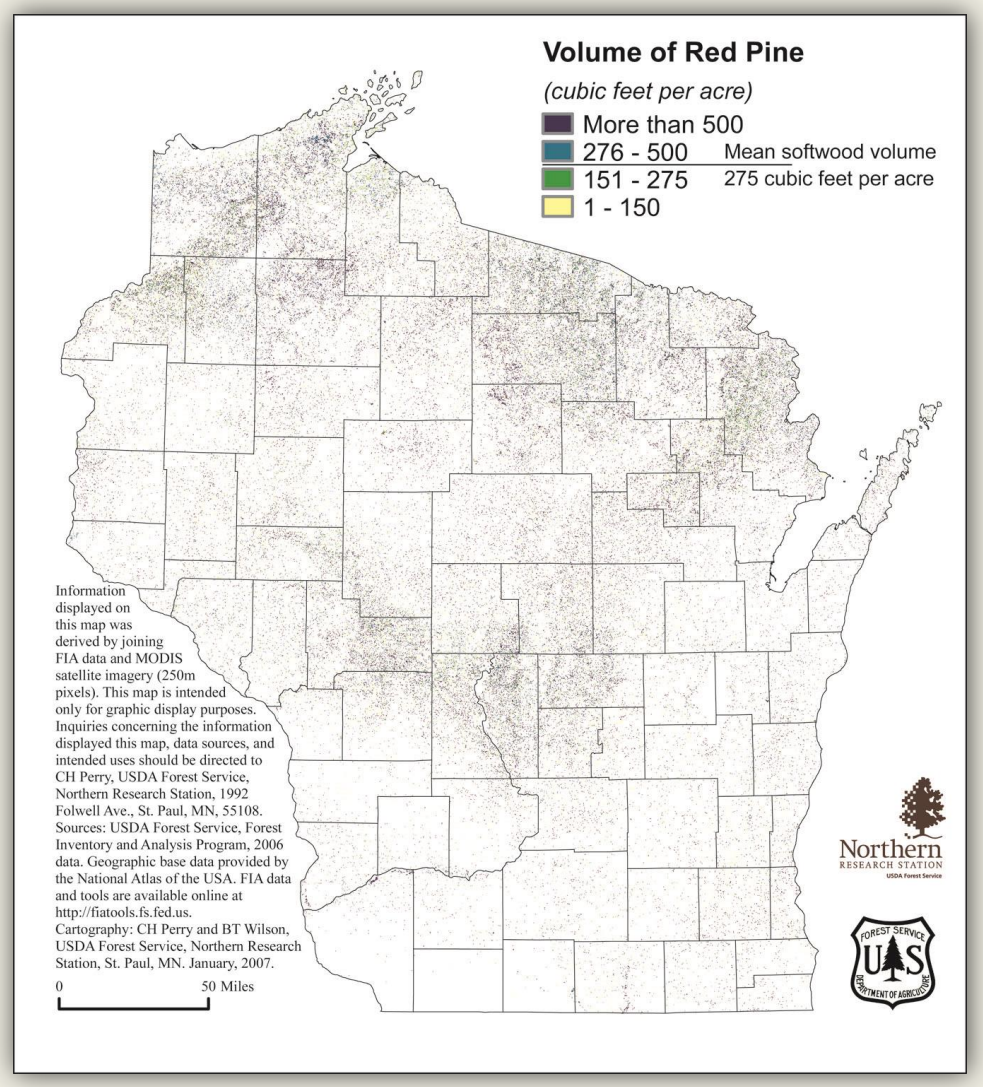


Chart 3. Percentage change in the number of live trees by size class between 1996 and 2012.
Source: USDA Forest Inventory and Analysis data 1996, and 2012.

"Where does red pine grow in Wisconsin?"

Growing stock volume by region with map



The great majority of red pine, 78%, is planted and occurs mainly in the sandy soils of central and northern Wisconsin (Table 1). In addition, this species occurs sporadically on more mesic soils throughout the state.

Table 1. Growing stock volume (million cft) by region of the state.

Species	Central	North east	North west	South east	South west	Total
Red pine	479	593	462	40	72	**1,646**
Percent of total	**29%**	**36%**	**28%**	**2%**	**4%**	**100%**

Source: USDA Forest Service, Forest Inventory and Analysis 2012 data

For a table on **Volume by County for 2012** go to:
http://dnr.wi.gov/topic/ForestBusinesses/documents/tables/VolumeCountySpecies.pdf

"How fast is red pine growing?"
Annual net growth by region and year

Average annual growth of red pine was about 71.4 million cft/yr from 2008 to 2012, or 12.5% of statewide volume growth (Chart 4). Growth rates have increased by about 63% since 1996, mainly due to the increased growth of aging red pine forests.

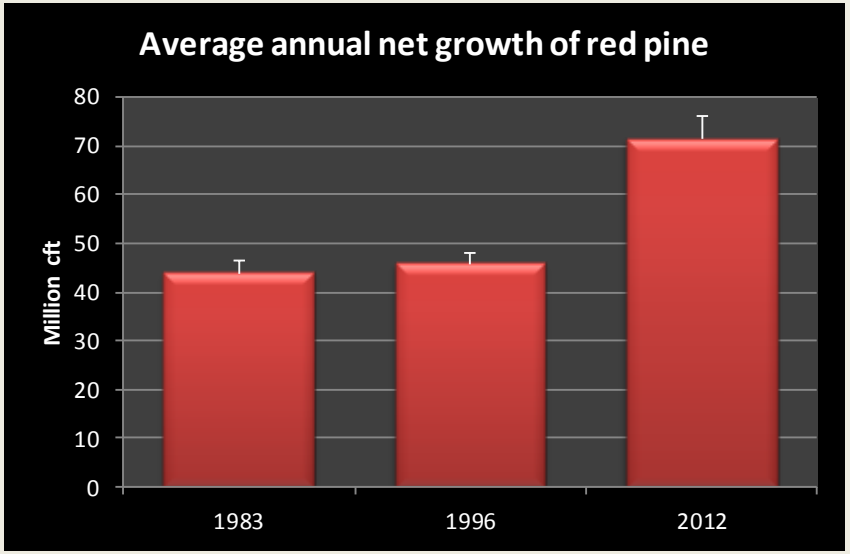


Chart 4. Average annual net growth (million cubic feet).
Source: USDA Forest Inventory & Analysis data: 1983, 1996, 2012

Table 2. Average annual net growth (million cft/year) and ratio of growth to volume by region of the state (2004 to 2012).

Unit	Net growth of red pine (million cft/yr)	Percent of total	Ratio of growth to volume
Central	22.9	32%	**4.8%**
Northeast	23.9	33%	**4.0%**
Northwest	19.1	27%	**4.1%**
Southeast	1.1	2%	**2.8%**
Southwest	4.4	6%	**6.2%**
Total	**71.4**	**100%**	**4.3%**

Source: USDA Forest Inventory and Analysis data: 2012

Although the highest volume of red pine occurs in central and northern Wisconsin, the highest growth to volume ratio occurs in the southwest part of the state (Table 2).

The ratio of growth to volume for red pine is 4.3%, much higher than the statewide average of 2.6% for all species.

For a table of **Average annual growth, mortality and removals by region** go to:
http://dnr.wi.gov/topic/ForestBusinesses/documents/tables/GrowthMortalityRemovals.pdf

"How healthy is red pine in Wisconsin?"

Average annual mortality: 1983, 1996, and 2012

Average annual mortality of red pine, about 3.2 million cft per year in 2012, has more than doubled since 1996 due to increases in volume (Chart 5). Red pine accounts for 7.6% of volume, 12.5% of growth but only 1.3% of statewide mortality.

The ratio of mortality to gross growth is 4.2% for red pine, **much lower than the statewide average** of 28.8%, and the lowest ratio of any commercial species (Table 3).

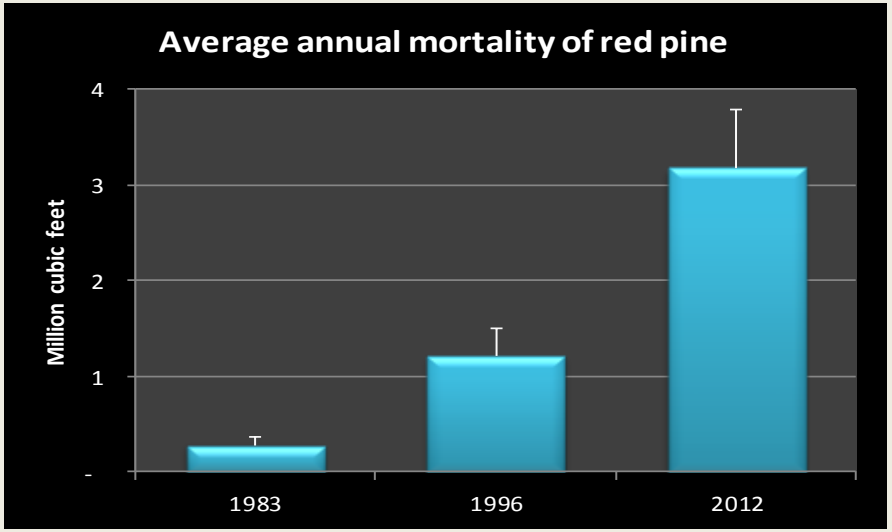


Chart 5. Average annual mortality (million cubic feet) by inventory year.
Source: USDA Forest Inventory & Analysis data: 1983, 1996, 2012

Table 3. Mortality, gross growth and the ratio of mortality to gross growth.

Species	Average annual mortality (cft)	Average annual gross growth (cft)	Mortality / growth
Red pine	3,168,224	74,600,755	**4.2%**

Source: USDA Forest Inventory and Analysis data: 2012

For a table of **Average annual growth, mortality and removals by region** go to:
http://dnr.wi.gov/topic/ForestBusinesses/documents/tables/GrowthMortalityRemovals.pdf

"How much red pine do we harvest?"

Roundwood production by product and year

In 2009, red pine accounted for 36.1million cft or about 10% of Wisconsin's total roundwood. Half was used for pulpwood and half for sawlogs (Chart 6).

Red pine pulpwood accounted for 11% of total pulpwood in the state and sawlogs made up over 20% of all sawlog production.

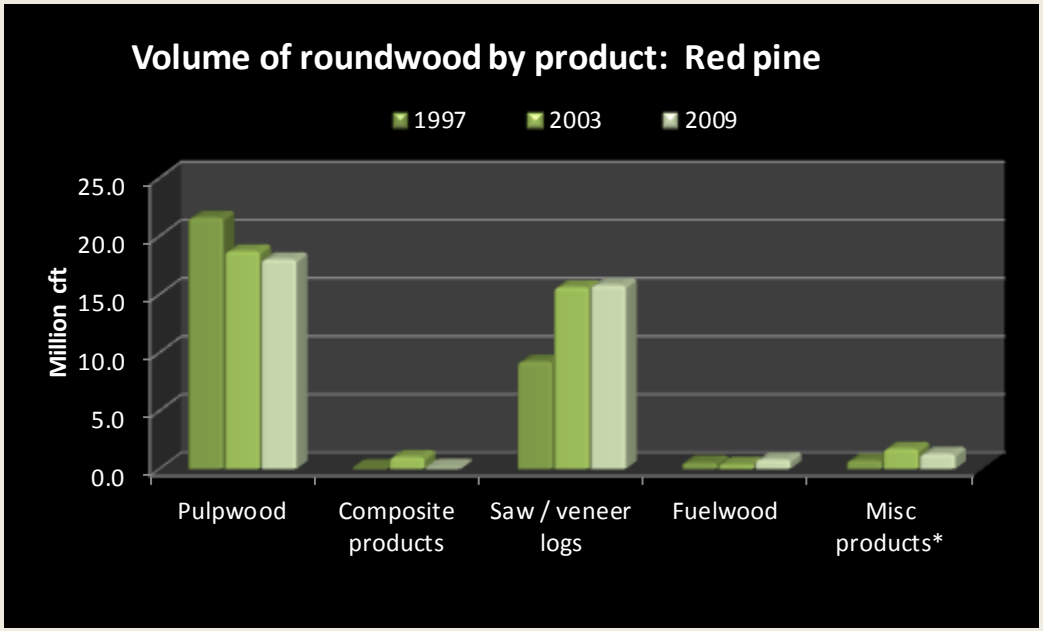


Chart 6. Volume of roundwood products. * Miscellaneous products include poles, posts, and pilings.
Source: Ronald Piva, USDA Forest Service, Northern Research Station, St. Paul MN

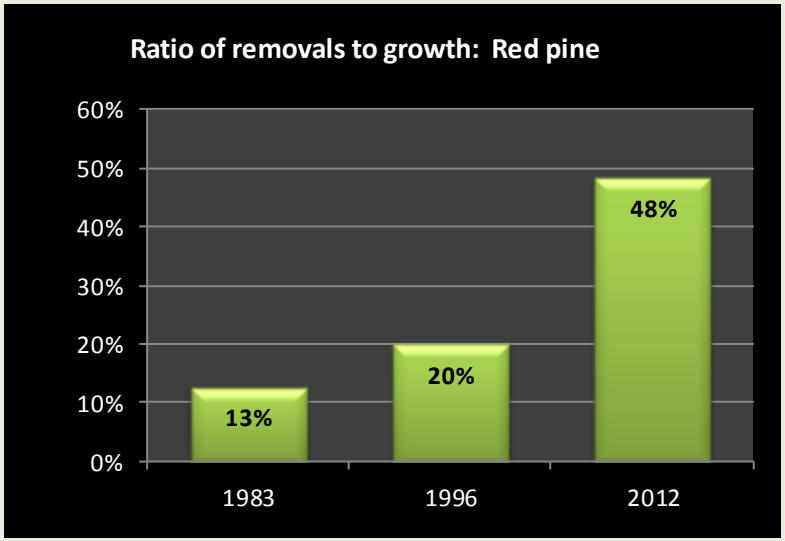


Chart 7. Ratio of volume harvested annually to net growth.
Source: USDA Forest Inventory & Analysis data: 1983, 1996, and 2012.

The ratio of removals to growth is 48% for red pine, lower than the average of 53.4% for all species (Chart 7). This is most likely due to very high growth rates since removals are also above average.

For a table of **Average annual growth, mortality and removals by region** go to:
http://dnr.wi.gov/topic/ForestBusinesses/documents/tables/GrowthMortalityRemovals.pdf

"How much is red pine selling for?"

Prices for cordwood and sawtimber: 2000 to present

Due to the variability of timber prices from year to year and region to region, two methods of reporting prices are presented here: Timber Mart North (Chart 8) and weighted average stumpage prices from Wisconsin Administrative Code Chapter NR 46 (Table 4).

According to the Timber Mart report, prices in 2012 are only slightly lower than inflation adjusted prices in 2000.

NR46 shows that red pine prices in 2012 were above the statewide average for all softwood cordwood and logs. Prices seem to have declined since 2006.

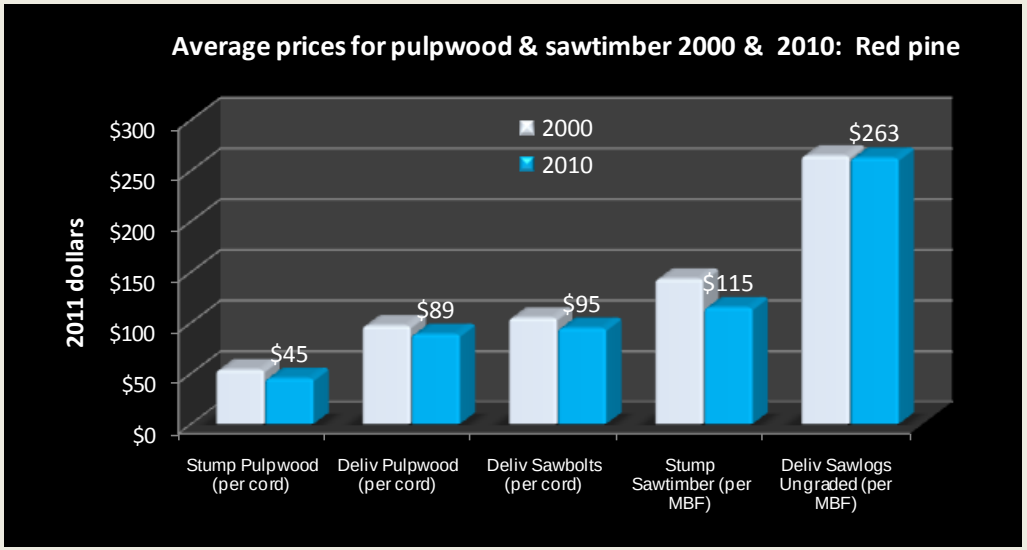
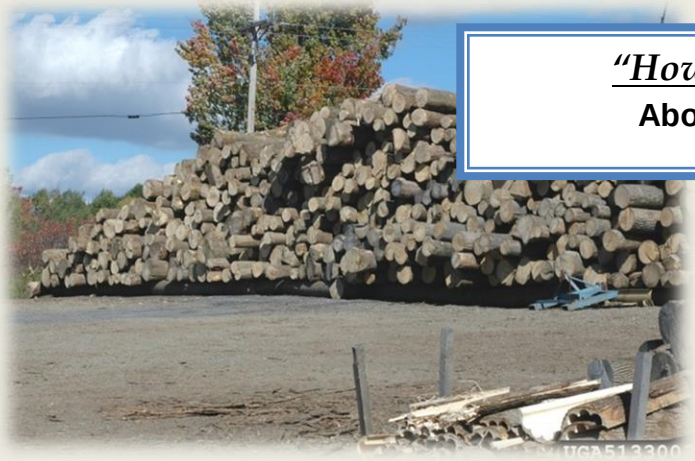


Chart 8. Average prices for cordwood and sawtimber (2008).
Source: Timber Mart North, George Banzhaf & Company, 8301 N. Allen Lane, Milwaukee, WI 53217

Table 4. Average weighted stumpage prices (adjusted for inflation to 2012 dollars) by year for Wisconsin.

Product	2002	2003	2004	2005	2006	2007	2008	2009	2010	2012	Average for all softwoods
Cordwood (per cord)	$62	$60	$61	$65	$59	$48	$35	$36	$36	**$36**	$30
Logs (per MBF)	$210	$176	$173	$192	$165	$116	$113	$121	$118	**$123**	$103

Source: Wisconsin Administrative Code Chapter NR46, 2002 to 2012. The stumpage values calculated each year are for the sole purpose of assessing MFL yield and FCL severance taxes, not for determining the price that should be received for timber.



"How much red pine biomass do we have?"

Aboveground carbon by region of the state

There were 30.5 million short tons of aboveground biomass in live red pine trees in 2012, a doubling since 1983. This is equivalent to approximately 15 million tons of carbon and represents 4.9% of all aboveground biomass statewide. As with volume, most red pine is located in central and northern Wisconsin (Chart 9).

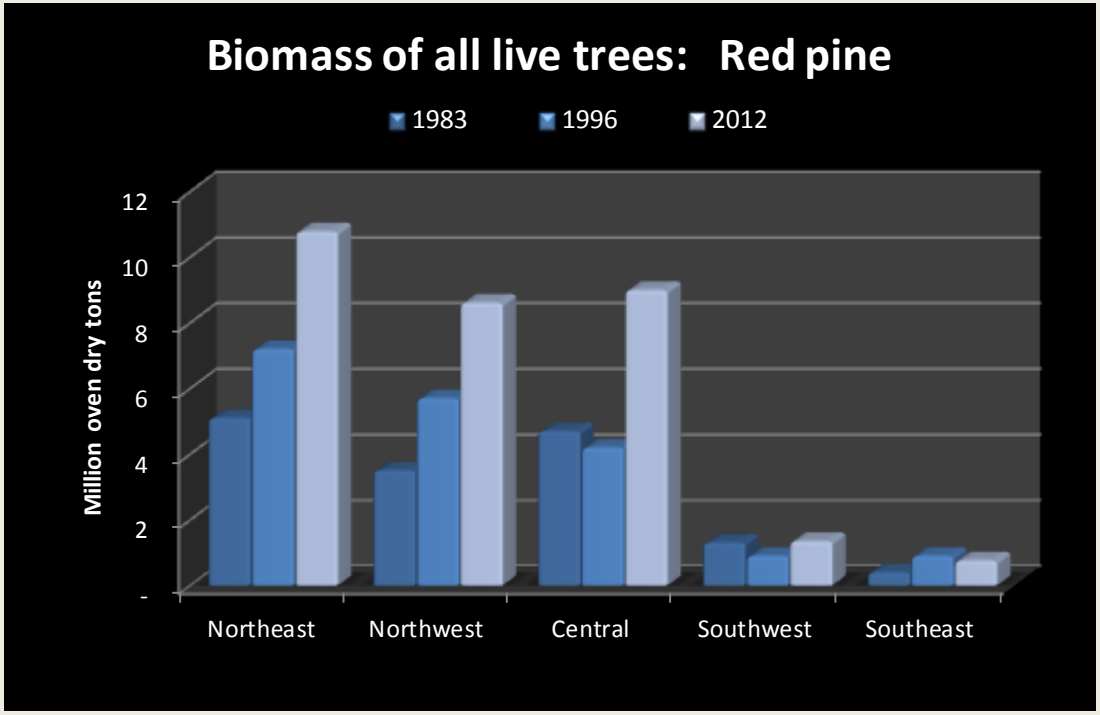


Chart 9. Biomass (above ground dry weight of live trees >1 in dbh, short tons) by year and region of the state.
Source: USDA Forest Inventory & Analysis data: 1983, 1996, and 2012

The density of red pine wood is about average for softwoods with a ratio of biomass to volume of 35.3 oven-dry lbs. per cubic foot (ODP/cft). The average for all softwoods is about 34.3 ODP/cft and for all species is 46.8 ODP/cft.

Approximately, 81% of all red pine biomass is located in the main stem and 14% in the branches.

For a table of **Biomass by County for 2012** go to:
http://dnr.wi.gov/topic/ForestBusinesses/documents/tables/BiomassByCounty.pdf